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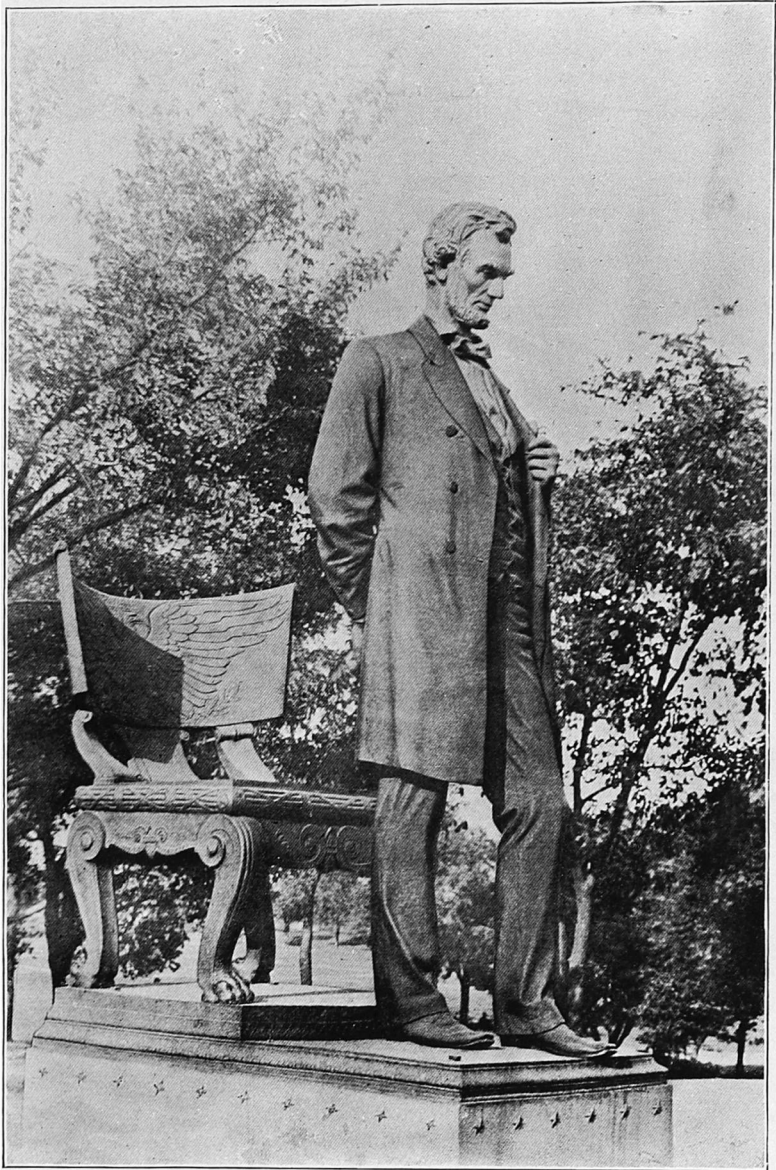
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ABRAHAM LINCOLN  
By Augustus Saint-Gaudens  
(Standing figure, with accessories)



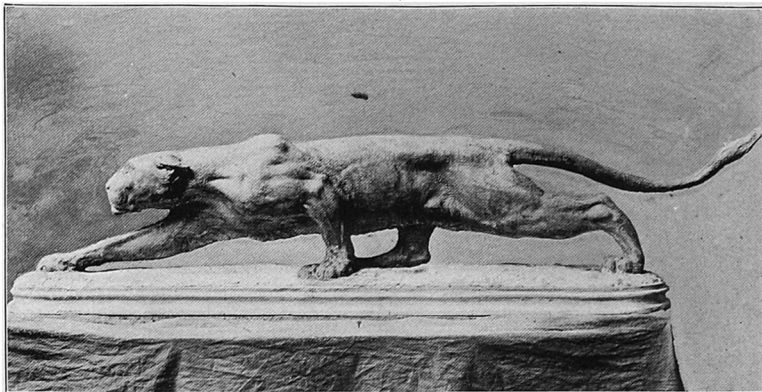
# BRUSH AND PENCIL

ILLUSTRATED ART NEWS SECTION

VOL. XVI

DECEMBER, 1905

No. 6



PANTHER  
By A. Phimister Proctor  
(Casting of animals)

## THE ART INDUSTRIES OF AMERICA—X

### THE CASTING OF BRONZES

Time was—and that not a great while ago—when it was assumed that the casting of bronzes was distinctively an Old World art, and that nothing worthy in this line was done on this side of the Atlantic. That time, however, has passed, and it is now recognized and frankly admitted that art casting can be and is done in this country as superior in point of fidelity and finish as anything produced in Europe. Like other art industries in a comparatively young people, casting of this character came rather tardily, but after a start had once been made, American ability quickly asserted itself, and the progress made was unusually marked. True, the establishments in this country now doing this kind of work are few,—they are, for that matter, in any country—but an industry of this character is to be gauged by the excellence of the results obtained, rather than by the grosser measure of extent.

NOTE.—Cuts selected to illustrate different types of work, and different problems presented to the casters.



STATUE IN BRONZE  
School of Michael Angelo.  
(Example of antique work)

ment be necessary, and cast. Many models, of course, are made the exact size desired, in which event it is only necessary to make the molds and do the casting. Other models, as for monumental pieces and architectural embellishments, have to be enlarged manifold, and the means of accomplishing this is, therefore, the first step to which we have to pay attention. The process described here is that invented by

Few people, probably, have any conception of how the statues they see in park and square, or the beautiful creations displayed in art-stores, are produced. From time to time, in *BRUSH AND PENCIL*, stray hints and suggestions as to the methods pursued have been given, and it seems advisable to gather together this scattered information as one of the present series of articles on the art industries. With the work of the sculptor we have here nothing to do,—the practical part of the sculptor's work will be the subject of a future article,—but only with the process of putting the sculptor's creation in enduring form in metal. We will start, then, with the assumption that the sculptor has completed the task of embodying his ideas in a model, which has been turned over to the workmen to enlarge, if enlarge-



ANDALUSIAN HORSEWOMAN  
By José Reyes  
(Casting of an equestrian statue)

Robert T. Paine, and is rapidly coming into general use, and the explanation given of the device used and of the manner of operating it is, in the main, in the inventor's own words.

The work of producing large statuary for buildings or grounds from the sculptor's original model is by modern methods thoroughly systematized and specialized. System and specialization here have certainly



FIGURE OF PAN IN THE CASTING  
(Showing plaster cast with inner and outer mold)

come by the same authority as in other economic fields—the conservation of effort and improved result. Statuary for this purpose is now modeled directly in staff or cement as it appears upon the buildings and grounds, whereas, previously, it had to be first enlarged in clay, usually by rudimentary methods, after which it had to be molded and cast. The new method is an immense improvement. To enlarge a copy on a scale from one to six times larger by the method now employed, the model given by the sculptor is placed upon an enlarging or pointing machine. This enlarging or pointing machine is simply a device for giving in exact proportion the different dimensions of the model, point by point, as desired by the operators of the machine. The device is not intricate, and in its operations will, without difficulty, be readily comprehended by thereader.

This pointing or measuring machine is constructed upon simple geo-

metrical principles. The model is placed upon a bracket which can slide vertically upon a revolving post. Upon one side of this post is another revolving post, which is to support the enlarged work, and upon the other side, and in line with the two, is a fixed post carrying a line of dots for the pivot point of the pointing or measuring arm to rest in. This pointing or measuring arm, which shows any two corresponding points upon the surface of the model and of the enlarged figure to be made from it, consists of simply a long, light, but very rigid, metal tube, to which is attached, extended at right angles to it, three tapering points. The points of these extensions are of fine steel, and when ready for work are exactly in a straight line, and of a distance apart according to the distance between the three posts. By regulating these distances any scale of enlargement can be obtained.

This pointer or pointing arm, with the three points, is counterbalanced so as to swing lightly in all directions, the point at one end held against the pivot post, the middle one touching some point upon the model, and the third point upon the free end showing the corresponding point upon the enlargement. Provided with this machine, the operator, a student, or any practical workman, builds up first a strong frame upon the general lines of the figure, continually measuring with the pointer to make sure that the frame is within the outlines of the figure which is to be. He proceeds to build up in the same way smaller and smaller portions, carefully keeping within the outlines of the figure until there appears what looks like a wooden skeleton of the statue. Knowing at any moment where the surface at any point is to be, the operator can leave a space of quite a uniform thickness (usually about one inch) for the coating of staff and cement used as a finish.

Having a sufficient supporting frame thus made of wood, and when the construction demands it of iron pipes and rods, the next step is to cover it with some sort of fiber, jute, burlap, or wood excelsior dipped in plaster of Paris. With this material the surfaces can be a little better rounded out and the smaller details better supplied. It is all, yet, built smaller and thinner than the finished statue is to be. Lastly, the operator marks points which it would be desirable to have located to enable a modeler to correctly copy the work upon the model with a pencil, and which he indicates with the pointer, while an assistant marks it upon the surface of the enlargement by driving in small nails. This completes the first process, and is called "pointing." Formerly the model was given at once into the hands of the skilled modeler, who by the laborious methods of measuring then in use constructed with far less exactness, but at a greater cost of time, what a comparatively unskilled workman with this device does so readily. This carefully pointed rough plaster figure with the model having the corresponding points marked is now given to the skilled modeler, who can at once apply his artistic ability in finishing the work on the enlarged scale—the last step in preparation.

The entire process of the reproduction in enlarged form of the sculp-

tor's scale model might thus be dismissed as a mechanical one. But the fact that an evident "sharpening" and improving of the original "working model" is necessary to give the intended effect will probably prevent



SOLDIERS' MONUMENT, MILWAUKEE WISCONSIN

By John S. Conway

(Casting of an heroic group)

the process ever becoming more than now a mechanical one. While this "finishing" or interpreting requires, naturally, the efforts of a modeler who masters styles and technique, it is also the testimony of the master sculptor of all times that the reproduction of a work of sculpture, in sentiment, in character, and in effect, can only be effected by the most mechanically perfect reproduction of all forms and dimensions in true proportion.



ST. FRANCIS  
By Augustin Querol  
(Casting in high relief)

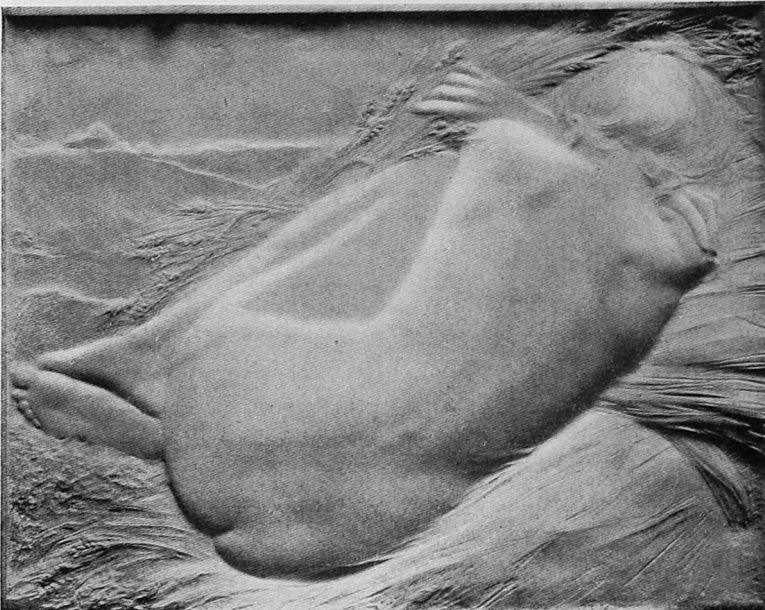
Thus, the work of reproducing on proper scale of the sculptor's models for casting readily resolved itself into two parts: first, "pointing," or the construction of the principal masses of the enlarged figure, and then marking as accurately as possible, in true relation and proportion, as many of the salient points in the surface as desired as guides to the finishing; second, the "finishing." The first part, "the pointing," is wholly mechanical. The second, the "finishing," bears a relation to the work of the author of the sketch model, similar to that which the conductor of an orchestra does, the work of the composer, and must be considered in a general way mechanical. Hitherto, the work of "pointing up," being done by the primitive method of measurements and cross-measurements by hand-compasses from point to point, was too elaborate and expensive for the temporary decorations of an exposition. The work was consequently vaguely done, the element of "free-hand," entering in too largely. It being so naturally in the field of mechanics, in due time the mechanical measuring or "pointing" machine described above appeared. In all cases where the sculptor makes his model the exact size desired, this process of enlargement is, of course, wholly eliminated, and the model goes direct to the foundry, into which the reader may now be introduced.

I have talked with men, intelligent men, who believe that molten bronze is simply cast into a mold, allowed to cool, and then the statue comes out just as the public sees it. As well say that nailing two planks together make a ship. The man who casts the metal for a bronze statue is de-



carving of as much fame as the man who designs the model. The least mistake or carelessness on his part, and the work of the artist goes for nothing. The statue is imperfect. The public laughs at it, even if it is accepted by the city authorities.

After the plaster model is received from the artist it is laid upon a form and built over with reddish sand. In order to get sand of the proper cohesiveness when worked, and stony hardness when dry, it is necessary to send to France. It is not obtainable in the United States. The best sand comes from within twelve miles of Paris. Proprietors of bronze factories have found out that it is better to get French workmen to handle this sand. The American is too impatient. This building up of a plaster mold is not so easy as one might think. The sand has to be fitted to it in little chunks of various sizes. These must be fitted snugly, and yet not so close together that they cannot be easily taken apart again when the impression is complete and the mold is dry. This requires patience and lightness of touch. If a man is impatient and rough, he will spoil his work, and must do it all over again. In a big cast there will be two thousand or more of these small pieces, which must be fitted together and



SUMMER—PANEL  
By Saint-Marceau  
(Casting in low relief)

accurately adjusted, or the cast will be ruined and all work must be done again. The reader will thus see the excessive care that is required.

When the blacks of sand are dry they are taken off the model one by one and carefully refitted. This makes the mold. It is then filled with clay. When the clay is dry the blocks forming the mold are again unfitted and a facsimile of the plaster cast is obtained. Then comes the most delicate part of the work. The clay model has to be reduced, or scraped out, until it is an exact but slightly smaller copy of the plaster model. At least one-quarter of an inch has to be taken off its entire sur-



TWO ELEMENTS—EARTH AND AIR

By L. Bompard

(Casting in medium relief)

face. The difficulty of doing this may be imagined, especially when the subject is at all ornate, like the Sherman statue at the Plaza entrance to Central Park, which required the greatest care.

Assuming the reduction of the "core," as it is technically called, to be satisfactorily accomplished, the "core" is introduced into the mold, which has again been put together. Then there is, of course, a difference between the exterior of the "core" and the interior of the mold. The core is steadied with iron rods so that it will remain rigid in the center of the mold, and the glowing molten bronze is poured in from the top until it completely fills the space between the "core" and the mold, thus forming a thin, quite uniform shell of metal.

After the metal is cold the mold is removed and the clay interior extracted. Then you have the model revealed very much as it will stand before the public, after a few finishing-touches. It took about three years to complete the Astor doors to Trinity Church, but the statue of Washington in front of the sub-treasury, in Wall Street, was finished in

about six weeks. That statue gave the makers a great deal of trouble. They tried to work too fast. At the same time it is one of the most beautiful and artistic specimens of bronze casting to be seen in the United



THE ARMY, BROOKLYN TRIUMPHAL ARCH  
By Frederick Macmonnies  
(Example of exceptionally elaborate group)

States. The alloy used for statue casting consists of ninety parts copper, seven of tin, and three of zinc. The Greeks, when they began to cast in bronze, used eighty per cent copper and twenty per cent tin.

This, in brief, is the story of casting in bronze. The reader will scarcely need telling that different works present different problems and necessitate different expedients. To enumerate the many perplexing difficulties that arise in the actual performance of the work is here out of the

question. That would naturally fall within the province of a hand-book, whereas this brief account is meant for the general reader, not the special student. A fair idea of the art, however, may be gleaned from the



BRONZE BUST  
By E. Fortiny  
(Simple ideal head)

account given. It goes without saying, moreover, that the higher the type of work, the less is intrusted to mechanical processes in the matter of preparation for the actual casting. A work designed to be the embellishment of a building, and not subject to close inspection, might safely be modeled in miniature and left to subordinates to be enlarged as described above, but a masterpiece would be executed in the model with jealous care by the sculptor himself and turned over to the foundrymen just as he wished it to appear in the enduring metal. A. J. PIETRIE.



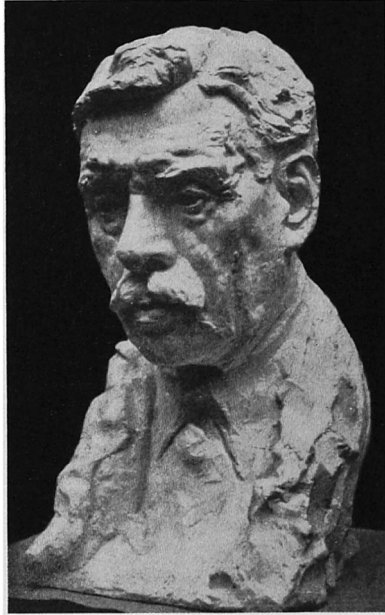
## OPEN LETTER ON THE ART TARIFF QUESTION

Strong expressions of opinion in favor of the removal of the duty on works of art have appeared simultaneously in many parts of the country. This fact is only one of the many evidences that we are entering upon a new phase in our national existence. Our success in business is unprecedented; our material progress among the nations of the world is unrivaled, but in one of the most important attainments—the development of the fine arts—we are still very far behind.

This deficiency in our national achievements is due largely to the natural difficulties under which we have labored. The youngest of the great nations, we have been forced to devote our energies to developing the resources of the country. The result has been the accumulation of vast wealth, and this having been accomplished, we are now beginning to realize our responsibilities on what might be called the finer side of life, the duty to increase the facilities for education and for the cultivation of a finer public taste and a keener appreciation of objects of beauty.

But as we turn to our new task, we are confronted with two obstacles. First, the fact that, unlike the nations of the Old World, we have inherited no art treasures from the great epochs of the past; and, second, that the law has penalized and discouraged the transfer of these art treasures to this country by imposing a duty upon them. The first obstacle is a natural one, which was absolutely unavoidable, but the second is an artificial barrier, which can be swept away by the stroke of a pen.

Is it not the paramount duty, then, of every Senator, Congressman, and citizen of the country to do everything in his power to remove this barrier from the path of progress? and have we not a right to expect that works



BUST OF FALGUIERE  
By A. Rodin  
(Casting of portraiture)



TRUTH  
By Daniel Chester French  
(Draped ideal figure)

of art will be placed upon the free list during the next session of Congress? The half-way measures which have been passed recognize and accept the principle for the complete application of which we are contending.

If this is true, as admitted, then the more we have of them in the country, the better. Their introduction should be encouraged in every possible way. It is not enough to remove the duty only from those which are to be permanently in public galleries; for, as the late Senator Hoar well said: "Private ownership is always very brief, and sooner or later the paintings get into public galleries." At the present time more than



DECORATIVE PANEL  
By Ernst Barlach  
(Relief high and low)

a third of the paintings on public exhibition in the Corcoran Gallery, Washington, D. C., with a valuation of more than one-half, are owned by private individuals. These paintings have paid the penalty.

American artists are unanimous in their demand for the removal of the duty. The only protection they wish is that which would come from its abolition; for, as a prominent artist has said, "Our livelihood depends upon the education of the public taste." As a source of revenue, the returns are insignificant as compared with the educational benefit which would be derived from the removal of the duty.

The objects of this league are to bring together into one strong, active movement the many factors and influences which are working for the abolition of this duty, to effectively organize public opinion throughout the entire country, and to present a bill at the next session of Congress. We believe that a thorough consideration of the subject will result in the legislation which we desire.

EDWARD R. WARREN

Secretary the American Art Club, Boston.

## EXHIBITIONS AND OTHER ART NEWS

Of more than passing importance was the opening on Saturday, November 18th, by the Pennsylvania Academy of the Fine Arts of the Gallery



BELL IN LOW RELIEF  
By Thomas Shields Clarke

of National Portraiture. By the opening of this gallery, the Academy marks the beginning of the second century of its career, and it is hoped and expected that this collection may be to America what the National Portrait Gallery in London is to the British Empire. Beginning with the portraits of Washington, Franklin, Morris, Clymer, Hopkinson, and Madison, and with the works of West, Stuart, Vanderlyn, Peale, Rush, Inman, and Sully already in its possession, the Academy aims first to add to and extend the series of portraits of the founders and makers of the republic, of the state of Pennsylvania, and of the city of Philadelphia, and of men and women notable in American literature, science, the arts, and social life. Second, it is proposed to include in the permanent gallery portraits

of those of any other country or state who have been emi-

nent in the history of affairs of the United States, or whose achievement or service to the world has given universal reputation. For the opening exhibition of this gallery, which will continue until December 23d, the Academy added, through the courtesy of the several owners, to its already notable collection, threescore or more portraits of distinguished people.

✻ The American Society of Miniature Painters, New York, announces that its seventh annual exhibition will be open to the public, at the galleries of M. Knoedler & Co., from Saturday afternoon, February 3d, until Saturday, February 17th, inclusive. The exhibition will consist



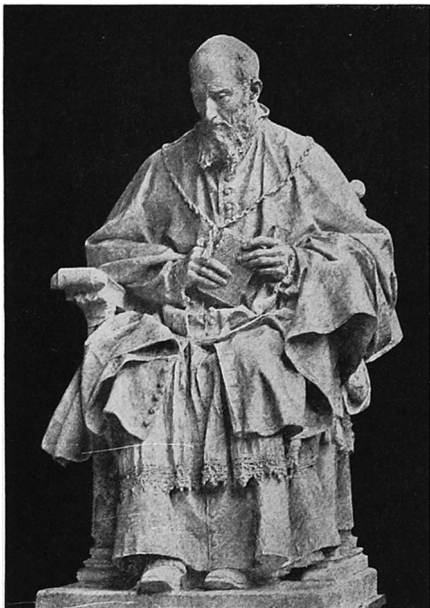
Roman Bronze, "Cybele," \$50,000; the Red Hawthorn Vase, \$50,000; the Flemish Tapestry, \$75,000; finally, Sword of Aben Achmet, \$50,000.

✿ It was almost the unanimous conclusion of the women forming the Greek Ethics Club of St. Louis, Missouri, that women cannot love art and man at the same time. She must give up either one or the other. George Sand's "Consuelo" brought up the discussion. Walter L. Sheldon, leader of the

Club, thought it possible, but the women were quite skeptical. One woman said: "Consuelo did not know her own mind. She didn't love art well enough to give up her life to it, and she didn't love Albert well enough to marry him."

✿ The German Artists' League has bought for fifteen thousand dollars the Villa Romana at Florence, and will remodel it for their purposes. Six studios will be prepared for as many German artists as wish to pass a few years at the Tuscan capital. Pictures painted there will be shown at the exhibition to be held hereafter in Germany by the League.

✿ Twenty-one American-born artists have exhibits at the autumn Salon, where the dominant note is impressionism, which the great pictures by Manet, filling one salle, embody in its startling beginnings. The large



JUAN DE RIVERA  
By Mariano Benlliure  
(Casting of seated figure)

American contingent received a disproportionate share of honors in the press, and French artists and critics express surprise that suddenly this relatively small Paris colony has attained such importance in quantity and quality of work. The popular American success, perhaps, is P. S. Horton's large canvas depicting the fête at the Elysée for the reception of King Alfonso.

✿ The Paris art journals announce the disbandment of a society originally organized for the purpose of taking French mechanics to the various historic châteaux of France, especially Chantilly, where the superb art collection left by the Duc d'Aumale to the French Institute is now open to the public. It was found that notwithstanding widespread invitations,